Date: Sat, 22 Oct 94 04:30:28 PDT
From: Ham-Space Mailing List and Newsgroup <ham-space@ucsd.edu>
Errors-To: Ham-Space-Errors@UCSD.Edu
Reply-To: Ham-Space@UCSD.Edu
Precedence: List
Subject: Ham-Space Digest V94 #298
To: Ham-Space

Ham-Space Digest Sat, 22 Oct 94 Volume 94 : Issue 298

Today's Topics:

Send Replies or notes for publication to: <Ham-Space@UCSD.Edu>
Send subscription requests to: <Ham-Space-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Space Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-space".

Date: 22 Oct 1994 07:05:55 GMT
From: gras@alaska.net (Gary Rasmussen)
Subject: AO-21

In article <84.13.uupcb@totrbbs.atl.ga.us>, jimmy.johnson@totrbbs.atl.ga.us (Jimmy Johnson) says:
>
>Can anyone tell me what has happened to Oscar 21? I am just getting into
>satellite communications but do not have all the proper equipment as
>yet. However I did enjoy listening to AO-21 during its pass but haven't
>heard anything from it for over a week. Can anyone help?
>
>I have just purchased a Yaesu FT-726R and need to either build or
>purchase my antenna's, but at least with the equipment I have now I
>could copy Oscar 21 quite well. Any help with this situation would be
>appreciated.
>
AO-21 failed last week (maybe) permantly. Ground control is working on

the problem but I've heard the prognois isn't good.

Gary Rasmussen
KL7GR

>JIMMY
>KD4ISP
>
>----
>Top Of The Rock BBS - Lilburn, GA SYSOP: Steve Diggs
>UUCP: totrbbs.atl.ga.us Snailmail: 4181 Wash Lee Ct.
>Phone: +1 404 921 8687 Lilburn, GA 30247-7407

Date: 22 Oct 94 05:54:18 GMT
From: sphillip@nyx10.CS.du.EDU (Steven Phillips)
Subject: Ham-Space Digest V94 #266

unsubscribe ham-space

Date: 21 Oct 1994 18:26:13 GMT
From: caralt@gaig.upc.es (Jordi Caralt Barba)
Subject: More Satellite tracking for amateurs

I am gratefully surprised by all the interest showed through E-mail by this project. In response to all the people that required more information I would like to extend myself a bit further over the Static Satellite Tracking Device.
The system consists in a planar array of 19 elements. The disposition is crucial because of the frequency band I'm considering: UHF. By crucial I mean that a minute change in any of the describing factors of the array could ruin the beam shape and thus its directivity. This consideration is a hard limiter because it considerabily reduces the number of possible configurations. After a long period of tests and computer simulation I have decided that the best configuration is hexagonal, with all the elements spaced about half wavelength (this "about" is specially tricky) filling the hexagon in a triangular lattice. Many other configurations were considered (circular, square, linear, etc) but none proved to be so efficient in terms of directivity versus beam direction.
The next step is the control of the beam. We must take into account that most amateur satellites cross the sky in few minutes. Thus, an easy and fast control system must be used. Because I wanted the array to be totally static, the only way to move the beam is to gradually change the elements phase, as widely known. Using a small algorism I can find the adequate phase for each element and thus, direct the beam towards the place

desired (that is, where the satellite is).
Another important decision to take is what radiating elements should
be considered. As you
may well know, most satellites transmit with circular polarisation: that is
because at this
frequencies is not possible to use linear polarisation because of Faraday's
Rotation. So, we must find an element that, radiating together with the
rest of the elements of the array, the transmitting-receiving electric
field be circular polarised (the sense of rotation CW or CCW is also to
be considered). I have carried out several computer simulations because
I wanted to study the change in polarisation of the electro-magnetic field
due too the changes of direction. You all know about this: imagine a
radiating loop placed in the XY plane. The polarisation in the z-axis
(elevation=90 degrees) is circular (CW or CCW depending on the sense of the
feeding current). But as you decrease elevation, polarisation is no longer
circular but elliptic. So, if the satellite is transmitting circular we get
signal loss, depending on the excentricity of the ellipse. I've concluded
that the best option is to use crossed half wave dipoles fed by equal current
amplitude but a phase shift of 90 degrees to obtain circular polarisation.
Computer simulation showed that we can get almost 16 dB of directivity (gain)
at elevation angles of 30 degrees. This means that the array can track
satellites in a range of 120 degrees, which I thing is quite remarkable.
If we can accept a loss of 3 dB the range increases to 140 degrees.
At present, I'm working on the design of the RF part. Things to solve are
(suggestions will be welcome):

1. Normally arrays have much noise problems than other devices. Fortunatelly
I found an article containing some solutions, but eventhough we must use a
pre-amp for each element. This amplifier has to have a good noise figure
(and has to be cheap too!). I've been searching quite thoroughly but I
can't find a suitable transistor (Phillips, Siemens, Advantek, etc).

2. The usage of a pre-amp implies a switching device that differenciates
th transmitting and the receiving. I would like to use an electronic device
if possible, but a mechanic one should prove fine provided is easy to switch.

3. Phase shifters are made of lines of different lengths. The appropiate one
is selected by diodes, depending of the phase the radiating element has to
have. Because we are working with RF signals, the parasite condenser must be
very low. PIN diodes have very low values, but are difficult to find.

I would also thank anyboody that could give information on:

4. Is there any phase shifter in chip?
5. Is there anybody who knows something about high directivity planar arrays?
   Am I the first to attempt doing such a device?
6. If you are an Amateur Satellite operator, I'll be delighted to know
   something about the most usual problems you have to cope with.

Yours faithfully

Date: Wed, 19 Oct 94 20:49:35 GMT
From: pchien@ids.net
Subject: Next Sarex STS flight is STS-67

The next shuttle flight with SAREX manifested is STS-67, the
Astro-2 mission next February. The primary ham on the mission
is Dr. Ron Parise WA4SIR, who you may remember from the STS-35
SAREX ASTRO-1 (notice how I place the more important payload
first) mission of December 1990.

Several other crewmembers have expressed an interest in getting
their licenses, the commander Steve Oswald already has his
licence from a previous mission (and I can't remember his call
sign!), Wendy Lawrence and Sam Durrance have taken their tests
and are waiting for their call signs, etc.

Regretably SAREX is not flying on the STS-66 mission in November
or the STS-63 mission in early February - even though both of those
missions have astronauts assigned who have valid amateur radio
licenses.

Philip Chien KC4YER
no sig yet

In Article <37rt1t$j7g@newsbf01.news.aol.com>
wdunckel1@aol.com (WDUNCKEL1) writes:
>Could someone tell me what the next sarex mission number is? Ive had
>trouble trying to locate this!!
>
>Thanks Walt

Date: 20 Oct 94 15:43:59 GMT
From: coutts!wwg (Warren Gay)
Subject: RS birds usual down link

Bruce Robertson (brucerob@blues.epas.utoronto.ca) wrote:
: I'm attracted to the RS series of birds as a first foray into
: satellite work. In particular, the 10m downlink seems very practical
: at this point in the sun spot cycle. I have, then, a few questions for
: the experienced:
: 1. I'm thinking of homebrewing my transmitter. Is the uplink usually

: 21 MHz, 144 MHz or evenly split between them?

My limited experience with this bird is that RS-10 is the one that is usually ON (RS-10 and RS-11 cannot operate at the same time).

I've never tried 15m up yet (antenna situation prevents this at the moment), but when I was active, I was able to uplink on 2m often. You can determine the mode by the CW telemetry, but with a 10-20 minute pass max, you don't waste much time -- just try it. There is one mode that accepts both 2m & 15m uplinks at the same time:

```
Mode KA: Uplink         21.160 -  21.200   21.210 -  21.250
         Uplink        145.860 - 145.900  145.910 - 145.950
         Downlink   29.360 -  29.400   29.410 -  29.450
         BEACON          29.357 |  29.403   29.407 |  29.453
     Robot:   Uplink          21.120             21.130
         Uplink        145.820            145.830
         Downlink   29.403 |  29.357   29.453 |  29.407
```

Perhaps Mode KA is the "usual" mode?

: 2. What sort of power is practical for casual use of these birds?
: I have heard of qsos with 2w in a dipole; is that remarkable or par
: for the course?

I have heard my downlink with 3 watts on a good day. I'd suggest 5 - 10W would be a good starting place for 2m uplinks. I have no 15m experience on this bird.

: 3. Has anyone any experience using mobile whips (argh) as antennae for
: this application?

Adventurous aren't we?

: Thanks in advance, VE3UWL
: Bruce G. Robertson

Warren W. Gay VE3WWG John Coutts Library Services Limited

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(or wwg%coutts@uunet.ca, wwg%coutts@uunet.uu.net)

End of Ham-Space Digest V94 #298
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